Proximity to humans affects local social structure in a giraffe metapopulation

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Abstract: 1. Experimental laboratory evidence suggests that animals with disrupted social systems express weakened relationship strengths and have more exclusive social associations, and that these changes have functional consequences. A key question is whether anthropogenic pressures have a similar impact on the social structure of wild animal communities. 2. We addressed this question by constructing a social network from 6 years of systematically collected photographic capture-recapture data spanning 1,139 individual adult female Masai giraffes inhabiting a large, unfenced, heterogeneous landscape in northern Tanzania. We then used the social network to identify distinct social communities, and tested whether social or anthropogenic and other environmental factors predicted differences in social structure among these communities. 3. We reveal that giraffes have a multilevel social structure. Local preferences in associations among individuals scale up to a number of distinct, but spatially overlapping, social communities, that can be viewed as a large interconnected metapopulation. We then find that communities that are closer to traditional compounds of indigenous Masai people express weaker relationship strengths and the giraffes in these communities are more exclusive in their associations. 4. The patterns we characterise in response to proximity to humans reflect the predictions of disrupted social systems. Near bomas, fuelwood cutting can reduce food resources, and groups of giraffes are more likely to encounter livestock and humans on foot, thus disrupting the social associations among group members. Our results suggest that human presence could potentially be playing an important role in determining the conservation future of this megaherbivore.

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Proximity to humans affects local social structure in a giraffe metapopulation

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KEYWORDS
anthropogenic disruption, community detection, *Giraffa camelopardalis*, Giraffe, social network analysis